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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

ANTONIUS H.M. HOLTSLAG ET AL.

PHNL 000547

SERIAL NO.: 10/043,384

GROUP ART UNIT: 2673

FILED: October 26, 2001

EXAMINER: A. Mengistu

SUB-FIELD DRIVEN DISPLAY DEVICE AND METHOD

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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RESPONSE UNDER 37 C.F.R. 1.111

This is in response to the Office Action mailed May 20, 2004, in which the Examiner rejected claims 1, 6-12, 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2003/0193449 A1 to Wakabayashi et al. in view of European Patent Application No. EP0903718 to Hirakawa et al.; and claims 2-5 and 13 under 35 U.S.C. 103(a) as being unpatentable over Wakabayashi et al. in view of Hirakawa et al., and further in view of U.S. Patent 6,249,265 to Tajima et al.

Applicants traverse the above rejections and offer the following explanations.

The Wakabayashi et al. patent reference discloses a display and its driving method, in which a sub-field driven

display device has a sub-field converter for converting video signals into sub-field data.

The Hirakawa et al. reference discloses an AC plasma display panel and method of driving the same, in which a field period is divided into 16 sub-fields, and these 16 sub-fields are grouped into 3 sub-field groups, wherein the sub-field groups are each assigned different luminance weights, each sub-field in a group having the same weight.

The subject invention relates to a device and method for sub-field driving a display device, in which the sub-fields are weighted to enable the displaying of a varying gray scale. However, as opposed to a binary weighting format, the subject invention weights the sub-fields in a ternary distribution of sub-field weights. The ternary distribution (e.g., 1, 3, 9, 27, ...) is described in the Substitute Specification on page 5, lines 5-25 (paragraphs [0014] - [0016]), wherein it is stated that by using a ternary distribution, all integer values of gray level between 0 and the maximum possible gray level can be realized in fewer sub-fields than when using, for example, a binary distribution.

Applicants submit that the prior art neither shows nor suggests a ternary distribution of sub-field weights. In particular, Hirakawa et al. discloses, at col. 9, lines 4-40, that each of the sub-fields SF1-SF5 of the first sub-field group SFG1 has the weight "1", each of the sub-fields SF6-SF10 of the second

sub-field group SFG2 has the weight "6", and each of the sub-fields SF11-SF16 of the sub-field group SFG3 has the weight "36". In this distribution, the sub-fields having the weight distribution - 1 1 1 1 1 6 6 6 6 6 36 36 36 36 36 36 - which is definitely not a ternary distribution of sub-field weights. If, on the other hand, one were to look at the distribution of sub-field group weights, this would be 1 6 36, which is a hexary (?) distribution of weights. As noted above, a ternary weight distribution would be 1, 3, 9, 27, etc.

The Tajima et al. patent discloses intraframe time-division multiplexing type display device and a method of displaying gray-scales in an intraframe time-division multiplexing type display device, in which a display device is driven in sub-fields wherein the sub-fields are weighted to enable the displaying of a varying gray scale. As shown in Figs. 36, 39 and 40 therein, the sub-fields are weighted in a substantially binary format, i.e.: 1, 2, 4, 6 (Fig. 36), 1, 2, 4, 8, 16, 24 (Fig. 39), and 1, 2, 4, 8, 16, 32, 48, wherein various combinations of these weighted sub-fields will form desired gray scale level.

However, Applicants submit that Tajima et al. does not supply that which is missing from Wakabayashi et al. and Hirakawa et al., i.e., a ternary distribution of sub-field weights.

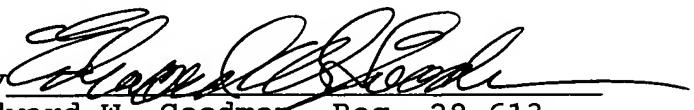
In view of the above, Applicants believe that the subject invention, as claimed, is not rendered obvious by the prior art,

either individually or collectively, and as such, is patentable thereover.

Applicants believe that this application, containing claims 1-15, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by

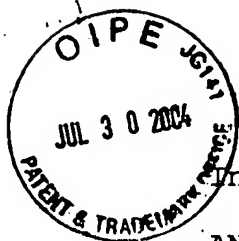
  
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On July 27, 2004  
By Burnett James



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Enclosed is an amendment in the above-identified application.

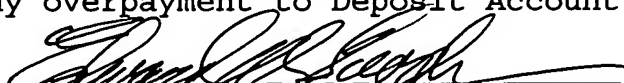
[ X ] No additional fee is required.

[ ] The fee has been calculated as shown below.

CLAIMS AS AMENDED					
	Claims remaining after amendment	Highest number previously paid for	Number extra	Rate	Additional Fee
Total Claims	15 Minus	20 <sup>1</sup> =		X \$18 =	\$
Independent Claims	2 Minus	3 <sup>2</sup> =		X \$86 =	\$
Multiple Dependent Claims, if any. If not previously paid, \$290.					\$
Total Additional fee for this amendment =					\$

<sup>1</sup>If less than 20, enter 20. <sup>2</sup>If less than 3, enter 3.

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on July 27, 2004  
Burnett James